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ABSTRACT

The question of whether the availability of need-based student financial aid reduces the applicant families' incentives to save and work was assessed. Changes in the need-based aid system are also suggested. Need-based aid systems compute a family's ability to pay for college from information on the family's income and assets at the time a student applies for aid. If a family can arrange to have fewer assets (by saving less during the students' precollege years or working fewer hours) the student will generally qualify for more aid. The two systems analysed in this paper are the Pell system of federal grants and the Uniform Methodology system. It is concluded that perhaps 20% or fewer of all financial aid applicants face substantial incentives to adjust their work or savings behavior in response to the Uniform Methodology's aid incentives. Students from these families are heavily concentrated in higher cost private institutions, since they would generally not qualify for aid at lower cost places. Adverse aid incentives flow primarily from institutionally-awarded aid, but are virtually nonexistent in the largest federal grant program, Pell Grants. The following strategies are suggested: reduce the marginal taxing rates facing families in the aid system, impute assets to parents with inadequate savings, extend the time period over which families are subject to needs analysis, and encourage parental effort through "matching" of parental contributions. (SW)

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Karl E. Case
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# Does Need-Based Student Aid Discourage Saving For College?

Karl E. Case
and
Michael S. McPherson

The Washington Office
of the College Board

January 1986

College Entrance Examination Board,
New York

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# Foreword and Summary

As government aid to college students has grown over the past quarter-century, it has sometimes been alleged that an unfortunate by-product has occurred: that families have been discouraged from saving for higher education or participating as fully as they otherwise might in the labor force. We believe that it is important to assess the validity of these charges in an era when available student aid funds have levelled off and when aid programs are subject to increasing scrutiny by skeptical public officials. We therefore asked Karl E. Case (Professor of Economics, Wellesley College) and Michael S. McPherson (Senior Fellow, Brookings Institution, and Professor of Economics, Williams College) to examine the extent to which incentive effects exist in student aid programs and, if effects exist that are judged important, what policy responses are possible.

This paper summarizes the results of a longer, more technical report in which the authors examine both simulation and empirical studies to determine the character and magnitude of the incentive effects of aid on savings and labor.* As this paper indicates, Case and McPherson conclude that for federal aid awarded under the Pell grant program, aid incentive effects are virtually nonexistent, largely due to the relatively low incomes and assets of Pell recipients and the low marginal taxing rate on incomes used in the Pell award system. For aid awards made under the needs analysis system called the Uniform Methodology, effects for the vast majority of students are still probably quite small. For a small group of relatively well off families whose children will attend high-cost schools, however, the effects may be more significant. This group probably constitutes no more than 20 percent, and perhaps fewer, of all financial aid applicants, though rising educational costs may make the high-cost situation more prevalent in the future.

Case and McPherson believe that the savings and labor disincentives concentrated at the higher cost colleges, though small, merit attention. They discuss four strategies for reducing savings and labor disincentives in student aid, each of which they find to have distinct advantages and drawbacks. Reducing marginal tax rates in the needs analysis system is one possibility, though it would be unacceptably expensive unless coupled with income cutoffs to reduce aid eligibility. The latter, however, could result in very different treatment for families whose incomes differ only slightly. A second strategy, imputing assets to parents with inadequate savings, would counter any incentive families perceive to avoid precollege saving but would be difficult to introduce and to administer. Extending the time period over which families are subject to needs analysis would have the advantage of sharply reducing yearly marginal tax rates and would also minimize current incentives to adjust the timing of labor supply to increase aid eligibility, though there are potential difficulties in administration that need to be explored. Likewise, encouraging parents to save and work by "matching" parental contributions to educational costs, which could be done by strengthening the link between the cost of college and the amount parents actually must pay, seems

*The technical report, "Student Aid Incentives and Parental Effort: The Impact of Need-Based Student Aid on Savings and Labor Supply," is available free upon request from the Washington Office of the College Board.

attractive in principle but needs further inquiry into problems of implementation. Whatever the ultimate merits of these particular strategies, the authors conclude that college finance should be conceived of in terms that go beyond the four-year perspective imbedded in the existing student aid system.

The authors wish to express their appreciation to the Washington Office of the College Board and to the College Scholarship Service for providing data and to Gary Burtless, David Fairris, Don Gillespie, Janet Hansen, and Gordon Winston for useful advice. They also benefitted from comments at seminars at Williams College and at the 1984 meeting of the American Economic Association. They are grateful to Lynn Murray, Maura Doyle, and Stacia Quimby for able research assistance; to Meropi McCoy for her usual superb work in manuscript preparation; and to Paul Wolman for many helpful editorial suggestions. The study was sponsored by the Washington Office of the College Board, supported in part by a grant from the Ford Foundation. The study also draws on work in progress by Michael McPherson under a grant from the Andrew Mellon Foundation. Its conclusions do not necessarily represent the views of any of these organizations nor the institutions with which the authors are affiliated.

Janet S. Hansen
*Director for Policy Analysis*

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# Does Need-Based Student Aid Discourage Saving For College?

# Introduction

Our society considers elementary and secondary education a basic right and provides it to all, regardless of income or wealth. With regard to postsecondary education, however, we have stopped considerably short of that point. Here, we expect parents and students to bear the costs of an advanced education from which they will reap particular benefits. Yet, as with basic education, we continue to believe that students should have equal opportunities to be educated up to their capacity, regardless of their financial circumstances; we don't want to deny postsecondary educational access to people simply because they lack resources.

These two principles—parent/student responsibility and equality of access—lie at the heart of the federal, state, and institutional policies that provide for and distribute need-based student aid in higher education. In our attempt to bridge the questions of responsibility and equity lurks an implicit conflict, however: Some families may be encouraged to take less responsibility to help themselves by an aid system designed to subsidize greater educational access. That is, to the extent that aid is apportioned by need—to those with lower accumulated savings and less income—families may find it economically advantageous to save less or to work fewer hours to provide for their children's educations.

The existence of an "adverse incentive" or "disincentive" effect would have at least two important implications for educational finance. First, it could implicitly penalize those who exert greater efforts either through saving more or working harder by reducing the share of student aid they could receive. Second, a decrease in parental effort would reduce the resources available overall to finance higher education, with consequent budgetary implications for governments and private institutions.

Although there is increasing discussion in the aid community about the effects of need-based aid on the incentives of families to contribute to their higher education costs, very little specific research has been devoted to the subject. Are there important disincentives? How significant are they? Which groups of student are most affected? How does the federal aid system compare to need-based aid awarded by institutions in creating adverse incentives? Do families actually respond to adverse incentives? Can needs analysis systems be changed to reduce or eliminate the problem—or even to encourage greater parental effort?

The authors of this paper have recently completed a larger study on this subject that draws on economic theory and on existing empirical studies of savings, labor supply, and college choice behavior to get some sense of the likely magnitude and direction of the incentives set up by need-based aid. Its general conclusion is that empirically important adverse incentives are probably confined to a specific segment of the aid population—namely, relatively affluent students at higher cost private institutions. For institutionally awarded aid at the large majority of schools, such effects probably matter much less. They are of little or no importance in the Pell system of federal grants, we found, and they have at best a modest role in the

operation of the federal Guaranteed Student Loan Program.[1]

Significant adverse "aid incentives" (i.e., savings and labor disincentive effects of aid) thus appear to be confined currently to a small set of schools and students. The issue still deserves attention, however, for several reasons. First, the extent and severity of these effects is sometimes exaggerated in popular writings; the resulting misimpressions should be corrected.[2] Second, the high-cost schools at which disincentives probably do matter, though small in number, represent an important segment of higher education. For them, such questions are significant. Third, if college costs continue to rise, and if need-based aid (whether federally or otherwise financed) continues to grow, the disincentive effects currently confined to the high-cost institutions may become more widespread and of broader concern.

The present paper reviews and analyzes the findings of our larger research project and is an attempt to show how we developed our investigative concepts, methodologies, and conclusions about the character and extent of aid-based disincentives. We also examine, in the latter part of this paper, several alternatives for modification of the need-based aid system that might reduce tendencies of the system to discourage parental effort and that might actually heighten the chances that some parents' efforts could be increased by the availability of aid. Some of these changes turn out to be of interest in their own right, apart from the questions of incentives that brought us to think about them.

Our findings suggest that the problem of aid and incentives is worthy of further study with original data, though this is not a task we were able to undertake for this paper itself. Moreover, we must note that this paper focuses exclusively on *dependent* students, and on *parental* effort. Incentive effects of the aid system on independent students are probably at least as important and certainly deserve attention. They are beyond our scope here, however.

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[1] Karl E. Case and Michael S. McPherson, "Student Aid Incentives and Parental Effort: The Impact of Need-Based Aid on Savings and Labor Supply," available from the Washington Office of the College Board.

[2] As an example of overreaction to the problem, see Dennis Doyle and Terry Hartle, "College Loans That Reward Spendthrifts," *The Washington Post*, July 2, 1985, p. A17.

# How Aid Shapes Incentives

Why might we expect the availability of need-based student aid to reduce families' incentives to save and work? Need-based aid systems compute a family's ability to pay for college from information on the income and assets of the family at the time a student applies for aid. If a family can arrange to have fewer assets—by saving less during the student's precollege years—or a smaller income—by having one or both parents work fewer hours—the student will generally qualify for more aid.

In effect, the motivation to avoid having higher savings and earnings derives from the fact that the aid system imposes a "tax" on each extra dollar of assets or income, because the system requires part of each dollar of assets or income above specified levels to be contributed to college expenses. The amount of tax on an added dollar of assets or income (the "marginal tax rate") varies with the family's financial position and with the specific needs analysis system employed. The two major systems are described below.

Most colleges award their own funds and "campus based" federal funds according to the so-called Uniform Methodology. This system imposes quite steep marginal tax rates at relatively low incomes. Although the exact figures depend on specific details of the family situation, in general, a family of four earning more than about $40,000 in pretax income will face a marginal tax rate under the Uniform Methodology of about 47 percent. That is, for each added dollar of family income above $40,000, the student's aid award would be reduced by 47 cents. (At some point, of course, the contribution from added family income could become so high that no aid would be given at all.) The marginal tax rate for families with income under about $20,000 is considerably lower, however—about 22 percent.

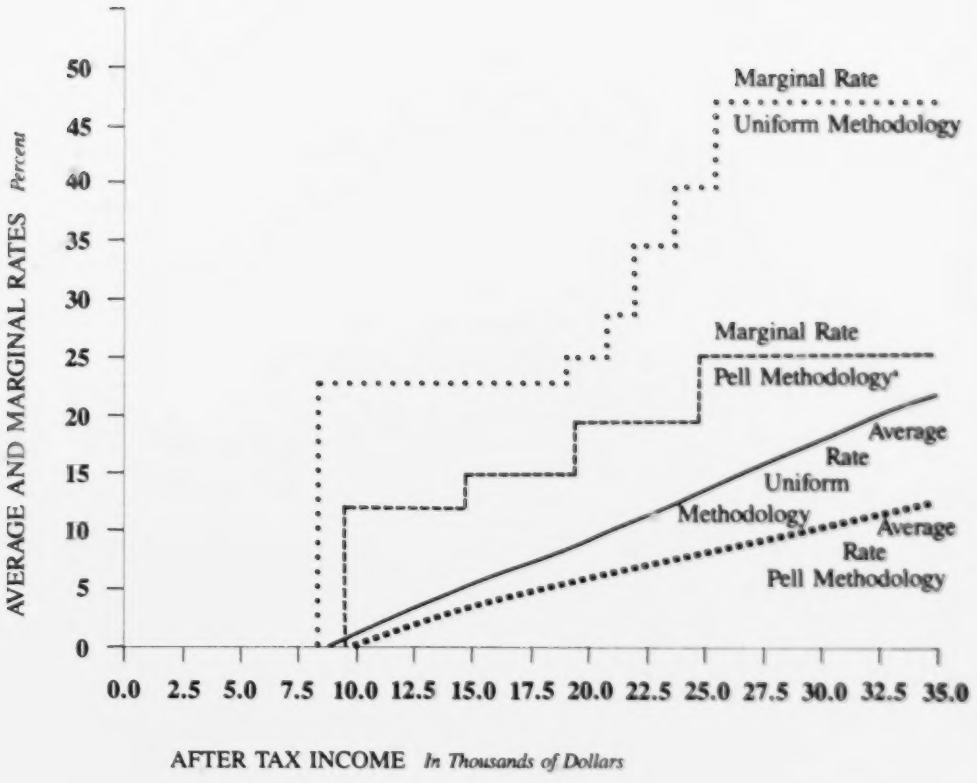
The bulk of federal grant money is provided according to a different needs analysis system, the Pell system. Its marginal tax rates are substantially lower than those of the Uniform Methodology, with a maximum rate of 25 percent. Moreover, the maximum effective rate is even lower, because any family with enough resources to contribute an amount equal to the Pell maximum grant (currently $2,100 per year) can receive no grant. Families reach this level when their incomes are being taxed at 18 percent, which is thus the highest effective taxing rate under Pell. A comparison of marginal and average taxing rates in the Pell system and the Uniform Methodology appears in Figure 1.[3]

Both systems tax assets as well as income. In the Uniform Methodology, 12 percent of total parental assets above a threshold are added to income and taxed at the applicable marginal rate. Since this tax is applied every year that the family has a child in college, the impact over a four-year college education can be substantial: For a family in the top (47 percent) taxing bracket, the marginal rate on assets over a four-year college career is 21 percent. The Pell system taxes assets above a threshold directly, at a rate of about 5 percent (or 19 percent over four years). However, because Pell sets the threshold on asset taxation higher than the Uniform Methodology and because few Pell recipients come from families with substantial assets, there is relatively little effective taxation of assets under Pell.

[3] *Average taxing rate* is the total expected parental contribution divided by the family's after-tax income; *marginal taxing rate* is the change in contribution per dollar change in after-tax income.

## Figure 1

**Marginal and Average Rates of Income Taxation in the Uniform and Pell Methodologies, 1984–85**




*Although the 25 percent marginal rate is defined in the Pell methodology, Pell eligibility in fact ends before that rate is reached.

# Do Incentives Affect Behavior?

From our analysis of the two needs analysis systems, we can conclude that the marginal tax rates of the Uniform Methodology, at least for those families with substantial income and assets, appear relatively "large," whereas those in the Pell system seem pretty "small." But it is hard to know what relationship these tax rates bear to persons' behavior, and it would be simplistic merely to assume that there is a necessary and direct relationship between "disincentives" in the tax rates and actual behavior. Is a 47 percent tax on earnings or a 21 percent tax on assets enough to make families revise their financial and educational plans? Our study sought to answer this question.

Economists have devised two main techniques for addressing this sort of issue. One is to examine the potential influence of incentives on behavior by analyzing the manner in which a *hypothetical* or simulated fully informed and rational household seeking maximum advantage would react to such incentives. The other is to examine the *actual* behavior of people who are confronted with similar situations, either by conducting social experiments or by analyzing the "natural experiments" imbedded in historical data.

## Savings Incentives

**Hypothetical model**

Let's consider the question of savings incentives first. We began by constructing a simple simulation model of a one-child family's lifetime consumption and savings decisions. We looked at how that family would behave depending on whether or not the family could expect to receive financial aid under the Uniform Methodology. The model assumes that a family's expected contribution is determined solely by its level of accumulated assets (we used a 20 percent marginal tax rate on assets) and that aid will meet the family's full amount of remaining need. The results, summarized in Table 1, are fairly dramatic: When the hypothetical family could expect to receive aid, their precollege saving dropped to less than *half* of what it would have been without the aid system, and the family's contribution to college costs dropped from $15,000 to $2,300. Our analysis of the *potential* effects of the highest asset tax rates in the Uniform Methodology thus shows that the incentive effects might indeed be large enough to matter.[4]

These are extreme results, however. Table 2 shows how they are modified when two simple qualifications are introduced into the model. First, the Table 1 results presuppose that the family does its planning on the assumption that its child will definitely attend college and receive aid. Second, the results assume that the net cost (after aid) of college attendance is independent of the school's tuition costs—in effect that all schools practice full-need financing and fund all need with grants. A family would plausibly expect to pay more to send a child to a costlier school—although for an aided student, not as much more as the posted tuition price implies.

[4] See the technical report for a fuller exposition of the simulation model.

**Table 1**

**Simulated Effects of Student Aid on Consumption and Savings Patterns: Cases in Which Parents Expect Aid to Meet Full Need (Values in 1,000s of Dollars)**

| | Case | | |
|---|---|---|---|
| Simulation measure | I<br>No child | II<br>No aid | III<br>Full aid |
| Consumption | | | |
| Precollege | 77.8 | 72.8 | 88.8 |
| Postcollege | 116.7 | 109.2 | 106.6 |
| During retirement | 175.0 | 163.7 | 159.8 |
| Saving | | | |
| Precollege | 22.2 | 27.2 | 11.2 |
| Postcollege | 83.4 | 90.8 | 93.4 |
| Cost of college | — | 15.0 | 15.0 |
| Assessed parental contribution | — | — | 2.3 |
| Expected cost to parent[a] | — | 15.0 | 2.3 |
| Expected aid[b] | — | — | 12.7 |

**Note.** The table reports simulations of lifetime consumption and savings behavior for a family with one child, under alternative assumptions about the financial aid system. For a fuller explanation of model assumptions, see the authors' technical report, "Student Aid Incentives and Parental Effort: The Impact of Need-Based Aid on Savings and Labor Supply."

[a] In this version of the model, expected cost to parent equals assessed parental contribution.

[b] "Expected aid" equals "cost of college" less "expected cost to parent."

The two qualifying factors affect the model in similar ways. If, say, the hypothetical family figures the child will have only a 50 percent chance of getting aid, we posit that it would make its saving decisions as if it expected to cover half the cost of the aid it would get in the favorable case, just as it would if grant aid on average met 50 percent of calculated need and the family were sure of receiving that aid. The cases in Table 2 show the consequences of varying the percentage of costs families expect to bear (for either of these reasons). Here, we see that the refined model also shows substantial effects of aid on savings: The more likely parents are to receive aid, or the greater the percentage of the parents' calculated need that grant aid promises to cover, the larger the parents' tendency is to reduce precollege savings. Notice, however, that in this model the reduced saving does not lead the parents to spend less on their children's education; instead, they take advantage of more generous aid to send the children to more expensive schools and actually on balance *raise* the family's contribution to education to do so. Nevertheless, parents still succeed in laying off some of the higher costs of schooling on the aid system by

**Table 2**

**Simulated Effects of Student Aid on Consumption and Savings Patterns: Cases in Which Expected Aid Falls Short of Full Need (Values in 1,000s of Dollars)**

| Simulation measure | Case I No aid | Case II 20% aid | Case III 50% aid | Case IV 65% aid |
|---|---|---|---|---|
| Consumption | | | | |
| Precollege | 75.3 | 77.1 | 80.0 | 83.5 |
| Postcollege | 112.9 | 111.0 | 108.1 | 105.2 |
| During retirement | 169.4 | 166.4 | 162.1 | 157.7 |
| Saving | | | | |
| Precollege | 24.7 | 22.9 | 20.0 | 16.5 |
| Postcollege | 87.1 | 89.0 | 91.9 | 94.8 |
| Cost of college | 7.5 | 9.3 | 14.4 | 20.0 |
| Assessed parental contribution | — | 4.6 | 4.0 | 3.3 |
| Expected cost to parent[a] | 7.5 | 8.4 | 9.2 | 9.3 |
| Expected aid[b] | — | .9 | 5.2 | 10.7 |

[a] "Expected cost to parent" exceeds "assessed parental contribution" because parents do not expect aid to cover full need. This may be because parents are uncertain of receiving aid, because colleges do not award enough aid to cover all need, or for other reasons.

[b] "Expected aid" equals "cost of college" less "expected cost to parent."

saving less and financing more of the education expenses they bear out of present and future consumption. (An example: In our calculations, when the probability of aid is 20 percent, parents pay 90 percent of the costs; when the aid probability rises to 65 percent, parents pay less than 50 percent of the costs.)

These particular results, we should emphasize, depend on the parameters of the model we set up and should be considered only as illustrative. But we think they accurately suggest that knowledgeable and foresighted parents facing the prospect of high tax rates on accumulated savings could significantly change their behavior in response. How common are responses to savings incentives and disincentives in real life?

**Actual behavior studies**

Our review of empirical studies of actual household responses to savings incentives suggests that households do respond to persistent and substantial financial incentives in making savings decisions but that their responses are neither as large nor as rapid as the hypothetical models of fully informed, rational households tend to imply. (We discuss the evidence and literature in more detail in our full report.) Our simulation model, then, probably exaggerates the effects to be expected in the

"real world," but both it and the empirical evidence seem to support the view that for the limited set of families facing the top marginal taxing rate in the Uniform Methodology, there are likely to be some nontrivial effects of aid on planned savings.

## Labor Supply

Regarding labor supply, the key feature of the tax imposed on earnings by need-based aid is that it is a *temporary* tax, which applies only during the years a child is in college. On the one hand, such a tax is unlikely to affect a family member's long-term career plans and so might affect earnings less than a permanent tax. On the other hand, such a temporary tax strongly encourages families to adjust the *timing* of work effort to avoid high earnings during years when tax rates are high.

**Hypothetical model**

Again, a simple simulation exercise we performed underlines the *potential* importance of the incentive to time work to maximize aid eligibility. We hypothesized a case in which a family wished to generate a parental educational contribution of $3,000 by following one of two options: (a) by having a nonworking spouse immediately enter the labor market to earn the needed money, or (b) by borrowing the money and having the spouse work after the child's graduation to pay back the loan. In the first case, the spouse has to generate more than $3,000 in earnings because the expected parental contribution will rise with the increment in family income. In the second case, the spouse also has to earn more than $3,000, to pay the interest on the loan. It is easy to show, however, that for a high-income family under the Uniform Methodology, the marginal tax rate of 47 percent compares unfavorably to a loan interest rate of, say, 15 percent. The spouse would wind up working fewer hours by following the second strategy: Borrow now; pay later.

The hypothetical example above assumes that the family is well informed about the aid system and that the spouse has perfect discretion about entering and leaving the labor market. But of course neither primary earners nor two-career couples have such perfect freedom. What does the empirical evidence have to say about the role of such incentives in practice?

**Actual behavior studies**

The "negative income tax" experiments conducted for the U.S. Department of Health, Education, and Welfare in the 1970s provide a relevant test of the impact of a temporary tax—temporary because participants knew in advance when the experiment would end. Like the need-based aid system, the experiments offered subsidies that were reduced as families' incomes rose. A main aim of the experiments was to estimate the effect of such aid "taxes" on labor supply.

The experiments found rather small effects of a temporary tax on the working hours of adult men, who tend to be "locked" into full-time jobs with fixed hours. But married women, whose work more frequently is part time and intermittent, responded much more strongly to the temporary tax, reducing their hours of work

by between 20 percent and 50 percent in the various experiments. The magnitudes of the measured effects in the experiments are roughly comparable to similar estimates found in econometric studies of nonexperimental data (if anything, the effects of the experiments were a little smaller than in the econometric data).

If aid-recipient families are about as responsive to changes in after-tax wage rates as the subjects of these studies, families facing the top marginal tax rate in the Uniform Methodology would reduce the husband's labor supply by about 5 percent and the wife's by 20 percent to 25 percent, on average. This response configuration could reduce the family's expected educational contribution by over $1,500.

But, as with savings, actual labor supply responses in the educational aid situation are probably smaller than those manifested in experiments and in econometric studies. First, families are not fully informed about how the aid system works, and they may neglect the incentives to minimize labor supply. Second, the above calculations ignore the possibility that aid-eligible families face higher costs at more expensive schools; these calculations parallel the extreme cases in the savings simulations we discussed earlier. Such families may be induced to make greater efforts to send their children to "better" schools, thus tending to offset the discouragement effect on labor supply. Still, it is likely that some two-earner families facing high marginal taxing rates respond significantly to the incentives to reduce labor supply.

We must note that the discussion above focuses on the incentive effects on families in the top taxing bracket of the Uniform Methodology. Incentives in the Pell system are much smaller. The top effective Pell rate on income (18 percent) is less than 40 percent of the top rate (47 percent) in the Uniform Methodology, and few Pell families actually face that high a rate, or face an effective tax on assets. Thus, the incentive effects facing families of dependent students whose marginal choices are governed by the Pell methodology are almost certainly negligible.

# Who Is Affected by Incentives?

Our analysis of the impact of aid on savings and labor incentives allows us to construct a profile of the sort of family most likely to be responsive to "aid incentives":

1. The family has high enough income to face stiff marginal tax rates, but not so high as to be ineligible for aid;
2. Regarding savings, the family must have net assets exceeding the minimum threshold for subjecting assets to tax; and
3. Regarding labor supply, the family has two earners, since the labor supply decisions of secondary earners are much more responsive to marginal incentives.

Examination of a random sample of students who filed financial aid forms with the College Scholarship Service in 1981–82 sheds light on the size of these groups.[5]

Table 3 gives a rough estimate of the percentages of the filer population facing various tax rates under the Uniform Methodology and suggests that about a fourth of all filers face a tax rate about 30 percent. This is a relatively affluent group of aid applicants, most of whom have incomes above $30,000 (at 1981–82 prices, comparable to roughly $35,000 today). This group also contains a substantially higher percentage of two-earner families—over 70 percent in 1981–82, compared to well under 50 percent for lower income families. And, of course, these more affluent aid applicants are much more likely to have substantial assets subject to the aid tax.

**Table 3**

**Estimated Percentages of Uniform Methodology Filers Facing Various Tax Rates**

| Tax rate (%) | Population distribution (%) |
|---|---|
| 0 | 31.3 |
| 22 | 31.4 |
| 25 | 7.5 |
| 29 | 5.5 |
| 34 | 5.6 |
| 40 | 4.4 |
| 47 | 14.3 |

We conclude, then, that perhaps 20 percent or fewer of all financial aid filers face substantial incentives to adjust their work or savings behavior in response to the Uniform Methodology's aid incentives. Students from these families are heavily concentrated in higher cost private institutions, since they would generally not qualify for aid at lower cost places.

The principal policy concern about incentives, then, focuses on how these high-

[5] Neither the structure of needs analysis nor the socioeconomic characteristics of aid applicants have changed importantly since 1981–82 (allowing for inflation). We therefore believe these 1981–82 results are applicable to current realities.

cost private institutions handle their own institutionally based aid funds.[6] Aid incentives at this limited set of institutions may influence both the equity and the efficiency of the use of aid funds within this affluent group.

Incentive effects are a lesser concern for the federal aid programs as presently constituted. Many of the affluent students just discussed receive federally guaranteed student loans. Some but by no means all of these students will find that their effective borrowing limit is affected by their families' income and assets.[7] The families of such students will then face marginal disincentives to work and save. However, because the loans have to be paid back, the incentive effects will be smaller than the effects of changes in grants. Since the subsidy component in guaranteed student loans is roughly half the face value, the incentive effects should be about half as large for subsidized loans as for grants. Federal policy toward the loan guarantee program might then include concern for the incentive effects on this limited group—perhaps 10 to 15 percent—of guaranteed student loan borrowers.

Again, it is worth stressing that the Pell program has negligible incentive effects—owing to both the low incomes and assets of most Pell recipients and to the low marginal taxing rate on incomes in the Pell system.

6 Some of the incentive-sensitive families will also be receiving federally supported campus-based aid money, so the federal government has an interest in how institutions deal with this group of students.

7 Most students in this group who receive institutionally based grants as well as guaranteed student loans will find that it is the grant rather than the loan that is adjusted to their financial circumstances. Also, some guaranteed student loan recipients have their borrowing limit determined by a simplified needs analysis formula that ignores assets.

# Policy Implications and Strategies

For the great majority of financial aid recipients and notably for most recipients of federal aid, the evidence is that disincentives on families' work and savings are *not* significant. As we have stressed, disincentives are a nonissue in the Pell program and only a subsidiary issue for guaranteed student loans and other federal higher education programs.

However, disincentives may be a significant issue in relation to the award of aid (including federally supported loan and campus-based aid) to the more affluent applicants at high-cost private colleges. Further, if college costs and hence aid eligibility continue to expand, concern with expenses may become more widespread. Our study therefore included appraisal of a set of alternative ways of modifying needs analysis to reduce disincentives to work and save. As the following discussion shows, each of four alternatives we examined has distinct advantages and drawbacks.

## Strategy 1: Reduce Marginal Taxing Rates

Obviously, adverse incentives could be reduced by lowering the tax rates facing families in the aid system. But simply reducing tax rates, all else equal, has the effect of raising calculated need for many families. This is so both because expected parental contributions (EPCs) would fall for families currently qualifying for aid, and because families at higher income levels would qualify for aid.

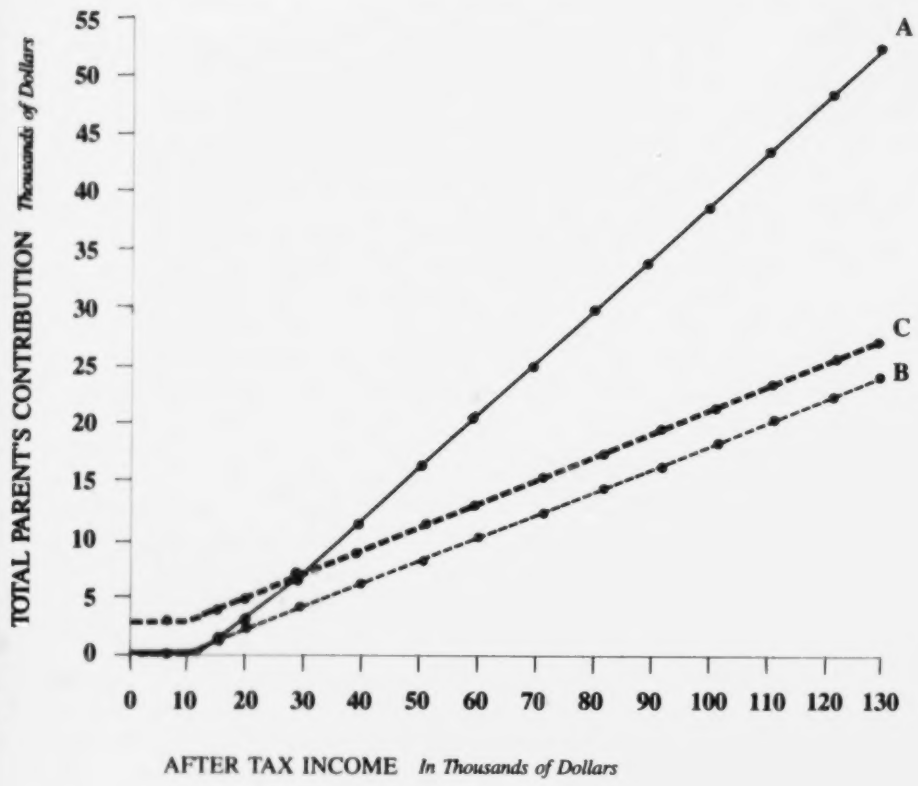
These effects are illustrated in Figure 2. Line A shows a schematic interpretation of the current system for a representative family with four members, with the EPC reaching $10,000 at an after-tax family income of about $40,000. (For simplicity, this presentation ignores the effect of variations in assets.) Line B shows the effect of eliminating the current progressivity in taxing rates, taxing all families at the current lowest rate, leaving all else constant. The effect is to reduce expected parental contributions (EPCs) for all families currently facing rates above the lowest. Moreover, EPC does not reach $10,000 until family income after taxes exceeds $60,000, thus dramatically raising the number of families eligible for aid. This is unattractive not only because colleges would be unable to meet such dramatically higher need but also because most observers would agree that such an assessment would greatly underestimate families' ability to pay.

Two procedures exist to combat the resulting increase in calculated need. One is to shift the whole tax schedule up—in effect raising the tax on lower income families to make possible rate reductions for higher income families. This is illustrated in Line C, which simply shifts Line B up. Even a substantial upward shift of this kind would, however, still leave a large increase in the number of families eligible for aid.

A second aspect of change would then be to cut off aid eligibility above some income level, requiring all families above that income level to pay full college costs. (Such a cutoff level could be adjusted for family size, number in college, and so on.)

**Figure 2**

**Alternative Taxing Rates in the Uniform Methodology**



Various intermediate combinations of these two procedures are possible. Progressivity of the tax schedule could be reduced by less than the example suggests, and income cutoffs could be more or less stringent. Computer simulations could be employed to select combinations that would hold total calculated need constant (this exercise is analogous to designing a "revenue neutral" federal tax reform).

This strategy of reducing marginal tax rates, and then offsetting the effects on aggregated need through income cutoffs and higher taxes on low income families, has obvious disadvantages. Higher taxes on lower income families may conflict with goals of "vertical equity" and equal opportunity. Introducing an income cutoff for aid is also troublesome from the standpoint of vertical equity, since it may imply very different treatment for families whose incomes differ only slightly. A family with income just below the cutoff might qualify for thousands of dollars of aid, whereas one just above the cutoff would receive no aid at all. Moreover, for families near the cutoff point, such a cutoff has very strong incentive effects, since there is a large reward to reducing one's income just enough to qualify for aid. Without a cutoff, however, reducing marginal tax rates would require either offering aid to families with much higher income than the current system permits, or else raising the EPCs of lower income families very substantially.

## Strategy 2: Impute Assets to Parents With Inadequate Savings

Under the current needs analysis system, parents can reduce their expected contributions by avoiding precollege saving. This behavior could be countered by using information about the family to impute an expectation about what the family should have been able to save, and basing expected parental contribution partly on that.

The difficulty here lies in developing appropriate information on which to base an imputation. In principle, if information costs and the intrusiveness of the financial aid form were no obstacle, one could simply obtain a complete financial history from every family, including all gifts and inheritances and a complete earnings history. One could then use the kinds of principles inherent in the existing needs analysis system to reach conclusions about how much savings families with various histories should be expected to have. EPCs could then be based on the results of such calculations. This procedure would have the advantages of avoiding treating differently families who have had the same savings opportunities but have chosen to deal with them differently, and of eliminating the opportunities we have analyzed in this paper for manipulating one's asset accumulation patterns in order to improve one's aid prospects.

In practice, unfortunately, any imputation scheme would have to operate with rather dramatically less information than this ideal. Imputations of past savings opportunities would have to be based on information about the ages of family members, their occupations, and their recent earning histories. A workable scheme

might be one that set a conservatively estimated floor under the amount that a family in particular circumstances should have been able to accumulate. Families would be expected to contribute from assets an amount based on that total, and all accumulations of assets above that floor amount would be taxed as now.

Clearly any equitable version of such a system would have to allow for exceptions. Families would have to be given the opportunity to prove that special circumstances justified their failure to have accumulated assets. Examples of such circumstances would be unusual past medical expenses or unusual business losses. Adjudicating claims for exceptions would no doubt be a major headache for aid officers.

A second difficulty would involve the timing of the introduction of the system. Families who had made their financial plans under the rules of the existing aid system might be justified in complaining about any sudden introduction of a new system that introduced ex post facto requirements on their behavior. On the other hand, it would be hard to announce credibly the introduction of such a system with the long (10- or 15-year) time lag that would be required to give families time to adapt to it.

Finally, there might be objection that the effect of such an asset imputation system would be to penalize unfairly the children of parents who had failed to save in the way the system expected. A possible reply is that the system currently imposes costs on children from families whose parents simply are unwilling to come up with the current EPC, and that such impositions are an inevitable feature of an aid system that assumes the first obligation of paying for college belongs with the family. Still, an imputation system would clearly make this potential source of inequity worse.

## Strategy 3: Extend the Time Period Over Which Families are Subject to Needs Analysis

Some of the potential disincentives in the current needs analysis system result from the fact that families are subject to its "taxation" for only a few years. This is one reason marginal tax rates need to be so high for those few years. Moreover, this feature gives families an opportunity to avoid taxation through modest changes in the timing of their receipt of income.

Suppose, instead, that a one-child family were routinely expected to pay for a college education over an eight-year period and were subjected to needs analysis, and eligible for aid, throughout that time. (For multiple-child families, some analogous extension of the time subject to needs analysis could be worked out.) Then the EPC could be roughly halved for each year the family was in the system, with a modest increase to allow for the interest cost of extending the payment period. Marginal tax rates each year would fall in the same proportion as the EPC—that is, they could be roughly half what they are now.

A reform of this sort would quite sharply abate the incentive for the family to reduce its labor supply during the college years, both because it would sharply

reduce marginal tax rates and because it would make much more difficult the shifting of work time out of the period of aid eligibility. Effects on savings incentives would not be as strong, because the tax collected over the full aid-eligible period on accumulated assets would not be affected by the change. But there would be some favorable effect on savings incentives, because families would find it more difficult to shift their saving activity from the precollege to the postcollege years.

Unlike Strategies 1 and 2, this proposal has strong attractions from the standpoint of both vertical and horizontal equity. The short time frame of existing needs analysis is the source of many inequities in the current system. For example, a family with two children five years apart in age is likely to receive much less total aid than a similar family with twins, even if total college costs for the two families are the same. Or, a family that is forced to realize a substantial capital gain while a child is in college may lose considerable aid that would not be lost to a family that can delay realization of the gain for a few years. Extending the period of needs analysis would diminish such inequitable timing effects.

We also suspect that a longer time frame for needs analysis would better reflect families' actual current financing practices and would provide a more useful temporal framework for deliberating about appropriate standards for assessing families' ability to pay.

## Strategy 4: Encourage Parental Effort Through "Matching" of Parental Contributions

A key point of our approach is to suggest that parental effort toward paying for college is encouraged when extra parental spending can result in their children's attendance at a preferred college. If colleges charging different prices expect the same parental contribution, and if differences in their aid packages are purely differences in grant aid, this "encouragement" effect is lost. Completely detaching parental spending from college attendance opportunities in this way meets one goal of student aid perfectly—that is, the goal of eliminating the financial element in students' choice of college. But the cost of this arrangement is that it leaves parents with no incentive (at the margin) to increase their effort if they wish to send their children to more expensive colleges.

In practice, this complete elimination of financial considerations is not achieved. On average, more expensive schools apply more stringent needs analysis, and differences in aid packages are likely to be partly differences in loans and self-help, which impose some financial burden on the family. Both these facts imply that aid-eligible families must typically spend somewhat more to send their children to more expensive colleges.

However, parental effort could be further encouraged by strengthening this link between the cost of a college and the net price facing the parent. This could be done in part by making the link more explicit and in part by increasing its quantitative magnitude.

One could design a scheme on the following lines: The needs analysis for a family would consist of two parts. The first part would be an estimate, based as

now on the family's financial situation, of what might be called the family's "basic" ability to pay—a kind of standard expected family contribution for families in its financial situation. The second part would base its assignment of the family's expected contribution in some proportion to the cost of the institution attended. One might construe the basic estimate of EPC as reflecting what the family should be expected to contribute to costs at an average in-state public institution; as families elected more expensive institutions, their expected contribution would go up proportionally, though with less than a dollar-for-dollar increase.

The second, "proportionality," factor could itself be made a function of the family's financial situation. For the lowest income families, EPC might not be made to rise at all with college costs—a proportionality factor of zero. On the other hand, for families with increasingly higher incomes, the factor might be set increasingly closer to 100 percent, so that they would be expected to bear a substantially greater portion of the added cost of sending a child to a more expensive school.

Many technical details would have to be worked out in implementing a system of this kind. More important than the technicalities would be the challenge of getting schools to agree on the proportionality factors to use. From the standpoint of parental effort, however, such a system would have real advantages. It would provide a clear link between parental spending levels on college and their children's college opportunities, thus encouraging effort. Moreover, if the proportionality factor rose with parental income, it would tend to provide the strongest encouragement of effort to those with the highest incomes in the aid population. These are the families facing the highest taxation rates and who therefore have the strongest incentive under present arrangements to reduce effort.

This proposal has considerable appeal on other grounds. The current needs analysis system has the unappealing feature that it may treat students very differently whose financial situation is only moderately different. For example, consider two schools, A and B, with tuitions of $5,000 and $8,000, respectively. Suppose the schools both award aid to the full extent of need and apply the same needs analysis. Further, suppose for simplicity that living expenses at both schools are identical and are covered by student self-help (loan and work). A student from a family earning, say, $40,000 a year whose family is assessed as able to contribute $4,800 a year will receive a $200 grant at A and a $3,200 grant at B—the family's costs will be independent of the student's choice of school. But a student from a family earning $50,000 per year would probably get no grant at all from either school. The first student must pay nothing extra to attend the more expensive school; the second must pay the full $3,000 difference. Introducing a proportionality factor that varied with a family's financial circumstances would tend to smooth this difference out. If a proportionality factor of 67 percent applied to the first family, they would be asked to contribute $2,000 extra to attend School B, whereas the more affluent family would have to contribute $3,000 extra. Whether or not these particular proportions seem right, there is appeal to the notion that the family's share of the incremental cost of attending a more expensive school should increase not abruptly, but rather gradually, with the family's financial resources.

# Conclusions

The principal conclusions of this analysis can be summarized in the following points:

1. The incentives created by the "taxes" implicit in the Uniform Methodology are large enough to have potentially significant effects on parental saving and labor supply behavior. Rational, well-informed parents who responded to these incentives as they do to other incentives economists have studied would, in some circumstances, significantly reduce their labor and savings to avoid the aid "tax."

2. The number of families who actually respond to the existing aid system in this way is probably fairly modest. This is so for several reasons. First, empirical studies of savings and labor supply suggest that the large potential effects on behavior that would be exhibited by fully informed and rational families are often attenuated in practice; this likely holds for the aid case as well. Moreover, many families in the aid system have relatively low incomes and face only modest tax rates, and therefore do not have strong incentives to modify their behavior. Finally, to the degree that the aid system offers parents the incentive to send their children to "higher quality" schools by making a larger expenditure, that incentive works to offset the disincentives to parental effort implied by the subsidy tax.

3. Nevertheless, there are some groups of families and colleges for whom these disincentives effects may be important now. Families in the aid-eligible population with relatively high income and assets, especially if both parents are working, are likely to be fairly sensitive to these incentives, particularly if they are considering sending their children to high-cost private institutions. Those institutions thus have more reason than others to be concerned about incentive effects of aid.

4. It is very unlikely that the Pell program, the major federal grant program, has important effects on families' incentives to work and save. Marginal tax rates on income in the Pell methodology are low, and few recipient families have substantial asset accumulations that would be subject to tax. On the other hand, some upper-middle-income families receiving federally backed student loans may face more substantial incentives to cut back on their work or savings efforts. Even these incentives are probably less important than those facing families receiving institutionally based grant support at high-cost private colleges.

5. If the need-based aid system remains unchanged, incentive problems are likely to become progressively more serious with the passage of time. This is so for two reasons. First, rising real costs of college could cause families at higher income levels to become eligible for aid; those families will generally face higher marginal taxing rates, and hence more significant disincentives, in the aid system. Second, as public awareness of the workings of the aid system grows, and as financial advisers increasingly become aware of the opportunities to decrease net costs of college by rearranging one's financial affairs, we can expect more parents to take student aid incentives into account in making financial plans.

6. Various modifications in the needs analysis system could reduce the disincentives examined here. Some of these—especially reducing the system's progressivity and imputing savings expectations to families—have very important drawbacks. Others—such as lengthening the period of aid eligibility and incorporating a cost-

matching feature explicitly into the system's calculations—seem rather attractive in principle, though they raise some real difficulties in implementation. It is not too early for those responsible for the aid system to begin exploring the pluses and minuses of such basic modifications in procedure.

* * * *

Besides these specifics, there is a more general lesson we believe can be learned from the sort of investigation we have undertaken. The questions of incentives we have taken up force the analyst to consider the aid system in a longer time frame than is usual. The needs analysis system as presently constituted focuses myopically on a family's current income and asset picture. Yet college expenditures are now large enough that it is reasonable to expect most families to finance them over a much larger portion of their lifetimes, either through borrowing or saving. The longer time frame that is needed to examine the ways in which families' work and savings behavior is modified by the aid system is also, we think, a much more realistic way to view the aid system as a whole. We feel that any contribution this paper may make to demonstrating the value of a more adequate temporal perspective on the aid system may well prove more important than its analysis of the disincentives issue as such.

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